

CALMIM Report Daily and Intermediate Cover (Based on Fink Road Landfill Site Location)
CalRecycle May 30, 2012

Daily cover (15% of 90 acres)- no vegetation or gas recovery; 9 inches silty clay loam; low organic content; default saturated bottom. Intermediate Cover (85% of 90 acres)- 75% gas recovery; 15 inches silty clay loam; low organic content; default saturated bottom.

Daily 15% 90 acre	Interm. 85% 90 acre	Final Report
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CALMIM Version: 5.0C Fink Road Landfill 04/14/2012		
*	Daily 15% 90 acre	Interm. 85% 90 acre
Gas Recovery	0%	75%
Cover Type	Daily	Intermediate
Cover area %	15%	85%

*	Daily 15% 90 acre	Interm. 85% 90 acre
Layer 1	SILTY CLAY LOAM 9	SILTY CLAY LOAM 15
Layer 2		
Layer 3		
Layer 4		
Layer 5		
Layer 6		
Layer 7		
Layer 8		
Layer 9		
Layer 10		

*	Daily 15% 90 acre	Interm. 85% 90 acre
Methane Concentration Base of Cover	0.3%	34.88%
Methane Emission without Oxidation (g/m ² /day)	2.56	158.55
Methane Emission with Oxidation (g/m ² /day)	2.51	25.59
% Oxidation	1.94	84.07
Total Cover Emissions with Oxidation (kg/year)	50051.42	2891699.76
Total Cover Emissions without Oxidation (kg/year)	51070.84	1.791590942E7
Remaining Oxidation Capacity(g/m ² /day)	0.0	1.39

CALMIM Report Final Cover (Based on Fink Road Landfill Site Location)

Final Cover (Total 584 acres for 25% to equal 146 acres)- water balance 4' silty clay loam; gas recovery 100% and 0% at 5% methane for shutdown; 50% vegetation; low organic content; base CH₄ varied from 55% to 5%; unsaturated free drainage bottom.

CALMIM Version: 5.0C Fink Road Landfill 04/14/2012				
*	Final 1	Final 2	Final 3	Final 4
Gas Recovery	100%	100%	100%	100%
Cover Type	Final	Final	Final	Final
Cover area %	25%	25%	25%	25%

*	Final 1	Final 2	Final 3	Final 4
Layer 1	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Final 1	Final 2	Final 3	Final 4
Methane Concentration Base of Cover	55.0%	50.0%	45.0%	40.0%
Methane Emission without Oxidation (g/m ² /day)	77.51	70.46	63.42	56.37
Methane Emission with Oxidation (g/m ² /day)	3.83	2.82	1.98	1.31
% Oxidation	95.2	96.19	97.11	97.92
Total Cover Emissions with Oxidation (kg/year)	826292.7	607933.4	426979.88	283423.87
Total Cover Emissions without Oxidation (kg/year)	1.671538758E7	1.519580089E7	1.367621419E7	1.215662749E7
Remaining Oxidation Capacity(g/m ² /day)	133.26	139.3	145.5	151.89

CALMIM Report Final Cover (cont.)

CALMIM Version: 5.0C

Fink Road Landfill

04/14/2012

*	Final 1	Final 2	Final 3	Final 4
Gas Recovery	100%	100%	100%	100%
Cover Type	Final	Final	Final	Final
Cover area %	25%	25%	25%	25%

*	Final 1	Final 2	Final 3	Final 4
Layer 1	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Final 1	Final 2	Final 3	Final 4
Methane Concentration Base of Cover	55.0%	50.0%	45.0%	40.0%
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Total Cover Emissions without Oxidation (kg/year)	1.671538758E7	1.519580089E7	1.367621419E7	1.215662749E7
Remaining Oxidation Capacity(g/m ² /day)	133.26	139.3	145.5	151.89

*	Final 1	Final 2	Final 3	Final 4
Gas Recovery	100%	100%	100%	100%
Cover Type	Final	Final	Final	Final
Cover area %	25%	25%	25%	25%

*	Final 1	Final 2	Final 3	Final 4
Layer 1	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Final 1	Final 2	Final 3	Final 4
Methane Concentration Base of Cover	35.0%	30.0%	25.0%	20.0%
Methane Emission without Oxidation (g/m ² /day)	49.32	42.28	35.23	28.18
Methane Emission with Oxidation (g/m ² /day)	0.8	0.43	0.17	0.04
% Oxidation	98.59	99.13	99.59	99.88
Total Cover Emissions with Oxidation (kg/year)	173400.76	92718.22	36910.47	9077.75
Total Cover Emissions without Oxidation (kg/year)	1.06370408E7	9117454.1	7597867.4	6078280.7
Remaining Oxidation Capacity(g/m ² /day)	158.31	164.79	170.83	175.9

*	Final 1	Final 2	Final 3	Final 4
Gas Recovery	100%	100%	100%	0%
Cover Type	Final	Final	Final	Final
Cover area %	25%	25%	25%	25%

*	Final 1	Final 2	Final 3	Final 4
Layer 1	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48	SILTY CLAY LOAM 48
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Final 1	Final 2	Final 3	Final 4
Methane Concentration Base of Cover	15.0%	10.0%	5.0%	5.0%
Methane Emission without Oxidation (g/m ² /day)	21.14	14.09	7.05	7.05
Methane Emission with Oxidation (g/m ² /day)	0.0	0.0	0.75	0.75
% Oxidation	99.98	100.0	84.25	84.25
Total Cover Emissions with Oxidation (kg/year)	622.24	18.88	162801.26	162801.26
Total Cover Emissions without Oxidation (kg/year)	4558694.01	3039107.31	1519520.61	1519520.61
Remaining Oxidation Capacity(g/m ² /day)	177.09	151.5	68.16	68.16

Additional CalRecycle CALMIM Simulations for Sensitivity (Based on Fink Road Landfill Site Location)

Varying daily and alternative daily cover (per acre)- no vegetation or gas recovery; 6-9 inches silty clay loam with low organic content; high organic content for ADC; default saturated base.

CALMIM Version: 5.0C
Fink Road Landfill
04/13/2012

*	Daily 1	Daily 2	Daily 3	Daily 4
Gas Recovery	0%	0%	0%	0%
Cover Type	Daily	Daily	Daily	Daily
Cover area %	25%	25%	25%	25%

*	Daily 1	Daily 2	Daily 3	Daily 4
Layer 1	SILTY CLAY LOAM 6	SILTY CLAY LOAM 9	ADC Wood Chips (all) 12	ADC Composted Organic Materials 12
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Daily 1	Daily 2	Daily 3	Daily 4
Methane Concentration Base of Cover	0.3%	0.3%	0.3%	0.3%
Methane Emission without Oxidation (glm ² /day)	4.3	2.56	4.12	2.53
Methane Emission with Oxidation (glm ² /day)	3.9	2.53	3.05	2.48
% Oxidation	9.03	1.27	24.64	1.94
Total Cover Emissions with Oxidation (kg/year)	5754.56	3737.9	4510.23	3666.86
Total Cover Emissions without Oxidation (kg/year)	6354.44	3785.95	6080.12	3734.65
Remaining Oxidation Capacity(glm ² /day)	0.02	0.0	0.32	0.0

Intermediate cover; 50-90% Gas Recovery; 12-15 inches silty clay loam; low organic content; 25% vegetation; default saturated bottom

CALMIM Version: 5.0C
Fink Road Landfill
04/13/2012

*	Int 1	Int 2	Int 3	Int 4
Gas Recovery	50%	90%	50%	90%
Cover Type	Intermediate	Intermediate	Intermediate	Intermediate
Cover area %	25%	25%	25%	25%

*	Int 1	Int 2	Int 3	Int 4
Layer 1	SILTY CLAY LOAM 12	SILTY CLAY LOAM 15	SILTY CLAY LOAM 15	SILTY CLAY LOAM 15
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Int 1	Int 2	Int 3	Int 4
Methane Concentration Base of Cover	38.25%	32.85%	38.25%	32.85%
Methane Emission without Oxidation (glm ² /day)	226.77	149.88	174.51	149.88
Methane Emission with Oxidation (glm ² /day)	122.03	18.31	39.05	18.31
% Oxidation	46.21	87.9	77.79	87.9
Total Cover Emissions with Oxidation (kg/year)	180247.97	27042.46	57687.69	27042.46
Total Cover Emissions without Oxidation (kg/year)	334961.33	221383.56	257775.62	221383.56
Remaining Oxidation Capacity(glm ² /day)	0.0	3.99	0.1	3.99

Additional CalRecycle CALMIM Simulations for Sensitivity (cont.)

Intermediate cover- 70% Gas Recovery; 12 inches silty clay loam; low organic content; vary vegetation 10-75%; default saturated bottom.

CALMIM Version: 5.0C
Fink Road Landfill
04/13/2012

*	Int 1	Int 2	Int 3	Int 4
Gas Recovery	70%	70%	70%	70%
Cover Type	Intermediate	Intermediate	Intermediate	Intermediate
Cover area %	25%	25%	25%	25%

*	Int 1	Int 2	Int 3	Int 4
Layer 1	SILTY CLAY LOAM 12	SILTY CLAY LOAM 12	SILTY CLAY LOAM 12	SILTY CLAY LOAM 12
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Int 1	Int 2	Int 3	Int 4
Methane Concentration Base of Cover	35.55%	35.55%	35.55%	35.55%
Methane Emission without Oxidation (g/m ² /day)	210.24	211.1	212.0	212.95
Methane Emission with Oxidation (g/m ² /day)	107.44	106.25	105.38	107.13
% Oxidation	48.86	49.7	50.38	49.81
Total Cover Emissions with Oxidation (kg/year)	158705.43	156942.53	155661.06	158238.43
Total Cover Emissions without Oxidation (kg/year)	310544.55	311815.44	313153.67	314557.47
Remaining Oxidation Capacity(g/m ² /day)	0.0	0.0	0.0	0.0

Intermediate cover- 70% Gas Recovery; 12 inches silty clay loam; 1-3: low-medium-high organic content; 25% vegetation; 4: high organic content and 75% vegetation; default saturated bottom.

CALMIM Version: 5.0C
Fink Road Landfill
04/13/2012

*	Int 1	Int 2	Int 3	Int 4
Gas Recovery	70%	70%	70%	70%
Cover Type	Intermediate	Intermediate	Intermediate	Intermediate
Cover area %	25%	25%	25%	25%

*	Int 1	Int 2	Int 3	Int 4
Layer 1	SILTY CLAY LOAM 12	SILTY CLAY LOAM 12	SILTY CLAY LOAM 12	SILTY CLAY LOAM 12
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Int 1	Int 2	Int 3	Int 4
Methane Concentration Base of Cover	35.55%	35.55%	35.55%	35.55%
Methane Emission without Oxidation (g/m ² /day)	210.76	202.08	197.49	199.23
Methane Emission with Oxidation (g/m ² /day)	106.02	100.16	97.14	97.69
% Oxidation	49.72	50.44	50.81	51.07
Total Cover Emissions with Oxidation (kg/year)	156603.51	147954.18	143484.31	144300.69
Total Cover Emissions without Oxidation (kg/year)	311316.87	298494.41	291712.62	294278.86
Remaining Oxidation Capacity(g/m ² /day)	0.0	0.0	0.0	0.0

Additional CalRecycle CALMIM Simulations for Sensitivity (cont.)

Intermediate cover; 75% Gas Recovery; low organic content; 25% vegetation; Int.1- 12 inches silty clay loam, no flux into bottom- free drainage; Int 2: 12 inches, default saturated bottom; Int 3-4: 15 inches.

CALMIM Version: 5.0C				
Fink Road Landfill				
04/16/2012				
*	Int 1	Int 2	Int 3	Int 4
Gas Recovery	75%	75%	75%	75%
Cover Type	Intermediate	Intermediate	Intermediate	Intermediate
Cover area %	25%	25%	25%	25%

*	Int 1	Int 2	Int 3	Int 4
Layer 1	SILTY CLAY LOAM 12	SILTY CLAY LOAM 12	SILTY CLAY LOAM 15	SILTY CLAY LOAM 15
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Int 1	Int 2	Int 3	Int 4
Methane Concentration Base of Cover	45.0%	34.88%	45.0%	34.88%
Methane Emission without Oxidation (g/m ² /day)	389.49	206.51	291.35	158.55
Methane Emission with Oxidation (g/m ² /day)	353.87	102.6	245.41	25.59
% Oxidation	17.07	50.39	26.36	84.07
Total Cover Emissions with Oxidation (kg/year)	522707.36	151553.09	362496.11	37800.0
Total Cover Emissions without Oxidation (kg/year)	575324.92	305045.05	430350.79	234194.89
Remaining Oxidation Capacity(g/m ² /day)	0.01	0.0	0.59	1.39

Intermediate cover; low organic content; 25% vegetation; default saturated bottom;
Int 1: 75% Gas Recovery, 12 inches silty clay loam; Int 2-4: 18 inches, 50%, 75%, 90% gas recovery.

CALMIM Version: 5.0C				
Fink Road Landfill				
04/16/2012				
*	Int 1	Int 2	Int 3	Int 4
Gas Recovery	75%	50%	75%	90%
Cover Type	Intermediate	Intermediate	Intermediate	Intermediate
Cover area %	25%	25%	25%	25%

*	Int 1	Int 2	Int 3	Int 4
Layer 1	SILTY CLAY LOAM 12	SILTY CLAY LOAM 18	SILTY CLAY LOAM 18	SILTY CLAY LOAM 18
Layer 2				
Layer 3				
Layer 4				
Layer 5				
Layer 6				
Layer 7				
Layer 8				
Layer 9				
Layer 10				

*	Int 1	Int 2	Int 3	Int 4
Methane Concentration Base of Cover	34.88%	38.25%	34.88%	32.85%
Methane Emission without Oxidation (g/m ² /day)	206.51	140.64	128.23	120.78
Methane Emission with Oxidation (g/m ² /day)	102.6	9.17	5.71	4.04
% Oxidation	50.39	93.54	95.58	96.68
Total Cover Emissions with Oxidation (kg/year)	151553.09	13544.8	8438.99	5970.62
Total Cover Emissions without Oxidation (kg/year)	305045.05	207737.02	189407.18	178409.28
Remaining Oxidation Capacity(g/m ² /day)	0.0	28.47	37.42	43.2